Paper No. 33

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte CHRISTOPH LEBMOLLMANN,
JOACHIM EICHER and HOLGER REINECKE

Appeal No. 2000-1103
Application No. 08/576,367

ON BRIEF

Before LIEBERMAN, TIMM, and JEFFREY T. SMITH, ***Administrative Patent Judges***.

JEFFREY T. SMITH, ***Administrative Patent Judge.***

DECISION ON APPEAL

Applicants appeal the decision of the Primary Examiner finally rejecting claims 18 to 32, all of the claims remaining in the application. We have jurisdiction under 35 U.S.C. § 134.

BACKGROUND

Appellants' invention relates to a process of producing a microstructured mold with at least one open cavity from a solid ceramic, glass, stone or monocrystalline material by precision mechanical machining, additive or subtractive structuring. The cavity is filled and the mold covered by a flowable material and the solidified flowable material is separated from the mold giving a microstructure element. (Specification, pp. 2-3). In another embodiment, the top portion of the solidified flowable material is removed to expose the surface of the mold and the solidified material filling the cavity. A layer of conductive material is applied to the exposed surface and remaining solidified material. Then the conductive layer and the remaining solidified material are separated from the mold to provide a structure with a shape complementary to the mold. A layer of metal is electrodeposited on the complementary structure and, finally, the metal layer is separated to produce a metallic microstructure element. (Specification, pp. 2-3). Claims 18, 31 and 32 which are representative of the claimed invention, appear below:

> 18. A process for the production of a microstructured element, comprising the steps of:
>
> (a) forming a microstructure of a microstructured mold having an open cavity on one surface thereof from a solid body by mechanical machining, additive structuring or subtractive structuring, wherein said mold consists essentially of

ceramic, glass, stone, quartz, gallium arsenide, germanium or mixture thereof;

(b) filling the cavity and covering the microstructured mold with a flowable plastic or sinterable material;

(c) solidifying the flowable material which has filled and covered the microstructured mold; and

(d) separating the solidified flowable material form the mold to provide a plastic or sintered material element having a microstruture complementary to the microstructured mold.

31. A microstructured element produced by the process of Claim 18.

32. A microstructured element produced by the process comprising the steps of:

(a) forming a microstructure of a microstructured mold having an open cavity on one surface thereof from a solid body by mechanical machining, additive structuring or subtractive structuring, wherein said mold consists essentially of ceramic, glass, stone, quartz, gallium arsenide, germanium or mixture thereof;

(b) filling the cavity and covering the microstructured mold with a flowable electrical non-conductive material;

(c) solidifying the flowable electrically non-conductive material to form a solid layer in contact with the surface of the microstructured mold and filling the cavity;

(d) removing a portion of the solid layer to expose the surface of the microstructured mold and the cavity filling with solidified flowable material;

(e) applying a layer of conductive material to and covering the exposed surface of the mold and filled cavity;

(f) separating the conductive layer and solidified flowable material in the cavity from the mold to provide a microstructure having a shape complementary to the mold;

(g) electrodepositing a metal layer on the complementary microstructure; and

(h) separating the metal layer from the complementary structure to provide a metallic microstructured element.

CITED PRIOR ART

As evidence of unpatentability, the Examiner relies on the following references:

Reichert	3,993,515	Nov. 23, 1976
Geissler et al. (Geissler)	4,759,887	Jul. 26, 1988
Hashiguchi et al. (Hashiguchi)	5,358,909	Oct. 25, 1994
Wuensch et al. (Wuensch)	5,415,977	May 16, 1995
Milinkovic et al. (Milinkovic)	5,470,651	Nov. 28, 1995
Koseki et al. (Koseki)	5,702,810	Dec. 30, 1997

The Examiner, in the Answer, rejected claims 18, 19, 21, 23, 24, 26 and 28 to 32 under 35 U.S.C. § 103(a) as being unpatentable over the combination of Wuensch, Milinkovic and Koseki and Reichert. The Examiner added Hashiguchi to the combination of Wuensch, Milinkovic and Koseki and Reichert to reject claims 20, 22 and 27 under 35 U.S.C. § 103(a). The Examiner added Geissler to the combination of Wuensch, Milinkovic and Koseki and Reichert to reject claim 25 under 35 U.S.C. § 103(a). (Answer, pp. 3-4).

Appellants have indicated, that the claims should stand or fall in the following groups: Group I (claims 18 to 27 and 31), Group II (claims 28 to 30), and Group III (claim 32). However, we note that Appellants' groupings of the claims mix statutory classes of invention. Accordingly, we will groups the claims based on their appropriate statutory class, process claims Group I (claims 18 to 30) and product claims Group II (claims 31 and 32). We will limit our consideration to claims 18, 31 and 32 as representative of the claims on appeal.

Rather than reiterate the conflicting viewpoints advanced by the Examiner and Appellants concerning the above-noted rejections, we refer to the Answer and the Brief. For

the reasons set forth below, we will sustain the Examiner's rejection of claim 31 and reverse the rejection of all other claims.

DISCUSSION

I.

The Examiner has rejected all of the process claims 18 to 30 over the Wuensch reference in combination with, *inter alia*, the Milinkovic, Koseki and Reichert references. A principal question in all of these rejections is whether the Examiner has established that the process described in Wuensch when combined with the other references renders the claimed process obvious. We answer this question in the negative.

Claim 18 is directed to a process for the production of a microstructured element, comprising the steps of forming a microstructure of a microstructured mold having an open cavity on one surface thereof wherein the mold consists essentially of ceramic, glass, stone, quartz, gallium arsenide or germanium mixture thereof. Wuensch discloses a process for the production of microstructures from a microstructured mold having an open cavity on one surface. The Examiner acknowledges the claimed process differs from the process of Wuensch because of the material from which the mold is formed. (Answer, pp. 5-6). To remedy this deficiency the Examiner relies on several other references to illustrate that

metal is equivalent to other materials suitable for molds such as ceramic, germanium or gallium arsenide. We acknowledge that mold structures can be formed from a variety of materials. However, the Examiner's position is deficient for at least two reasons. First, Wuensch discloses the mold material is electroconductive because after the polymer layer is applied to the mold, another metal is electro-deposited on the polymer layer. (Col. 1, l. 63 to col. 2, l. 15). The Examiner has not indicated that if the mold is formed from a material, such as those claimed, would be suitable for the electro-deposition application of a metal is on the intervening polymer layer. Second, while molds can be formed from various materials, the Examiner has not indicated that the various materials were known at the time of the invention to be suitable for microstructured molds. The mere fact that the prior art could be modified as proposed by the Examiner is not sufficient to establish a ***prima facie*** case of obviousness. ***See In re Fritch***, 972 F.2d 1260, 1266, 23 USPQ2d 1780, 1783 (Fed. Cir. 1992). The Examiner must explain why the prior art would have suggested to one of ordinary skill in the art the desirability of the modification. ***See Fritch***, 972 F.2d at 1266, 23 USPQ2d at 1783-84. The Examiner has not provided such an explanation. The 35 U.S.C. § 103(a) rejections of claims 18 to 30 are reversed.

II.

We must note that claims 31 and 32 on appeal are written in product-by-process format. Therefore, the Examiner has a lesser burden of proof with a rejection under section 102 or section 103 indicated where the prior art reasonably appears to disclose a product that is identical with or only slightly different than the product claimed. ***See In re Fitzgerald,*** 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980); ***In re Fessman,*** 489 F.2d 742, 744, 180 USPQ 324, 326 (CCPA 1974). Once the Examiner meets this lesser burden of proof, the burden shifts to Appellants to show that the claimed product materially differs from the product of the prior art. It is the product that must be gauged in light of the prior art, not the process limitations. ***See In re Wertheim,*** 541 F.2d 257, 271, 191 USPQ 90, 103 (CCPA 1976); ***In re Fessman, supra.***

The product of claim 31 is a plastic or sintered material element having a microstructure complementary to the microstructured mold. As stated above, the Examiner has found that Wuensch discloses a process for the production of microstructures from a microstructured mold having an open cavity on one surface. The Examiner acknowledges the claimed process differs from the of process of Wuensch because of the material from

which the mold is formed. (Answer, pp. 5-6). The Examiner has found that Wuensch discloses a patterned polymer layer that corresponds to Appellants' solid body. (Answer, p. 5). The polymer layer is applied to the metal microstructured mold and irradiation to such an extent that the irradiated polymer can be removed, giving a relief-like polymer structure on the electroconductive substrate. (Col. 1, l. 60 to col. 2, l. 5). Accordingly, we determine that the Examiner has met the initial burden of establishing a ***prima facie*** case of unpatentability under sections 102/103. Therefore, the burden has been shifted to Appellants to show that the claimed product differs substantially from the product disclosed by Wuensch. ***See In re Spada,*** 911 F.2d 705, 708, 15 USPQ2d 1655, 1657-58 (Fed. Cir. 1990); and ***In re Best,*** 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). Appellants have not submitted any evidence that the product of Wuensch is substantially different than the claimed product. The 35 U.S.C. § 103(a) rejection of claim 31 is affirmed.

Claim 32 is also is written in product-by-process format. The resultant product of claim 32 is a metallic microstructured element which has a structure that is complementary to the first microstructure. The claimed invention is produced by the solidification of a polymer layer on the microstructured mold. Removing a portion of the solid layer to expose the surface of the microstructured mold and the cavity filled with solidified flowable

material. Applying a layer of conductive material to and covering the exposed surface of the mold and filled cavity. Separating the conductive layer and solidified flowable material in the cavity from the mold to provide a first microstructure which has a shape complementary to the mold. A metal layer is electrodeposited on the first microstructure and subsequently separated therefrom. The result is a metallic microstructured element which has a shape complementary to the first microstructure.

The Examiner states "the recited metal microstructural element is not seen as differing from the metal microstructured mold insert of Wuensch." (Answer, p. 13).

The Examiner's conclusory statement fails to provide a factual basis to support a legal conclusion of obviousness as set forth in ***Graham v. John Deere Co.***, 383 U.S. 1 (1966). The Examiner has not met the initial burden of establishing a ***prima facie*** case of unpatentability under section 103. Therefore, the 35 U.S.C. § 103(a) rejection of claim 32 is reversed.

CONCLUSION

For the above reasons, the rejections of claims 18 to 30 and 32 under 35 U.S.C. § 103(a) are reversed and the rejections of claims 31 under 35 U.S.C. § 103(a) is affirmed.

Time for taking action

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED-IN-PART

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PAUL LIEBERMAN	)	
Administrative Patent Judge	)	
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	)	**BOARD OF PATENT**
CATHERINE TIMM	)	**APPEALS**
Administrative Patent Judge	)	**AND**
	)	**INTERFERENCES**
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JEFFREY T. SMITH	)	
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